

WE CLAIM:

1. A method for displaying elements of an information array within a predetermined two dimensional display space, wherein the predetermined two dimensional display space is divided into cells formed at intersections of columns and rows, the elements of the information array have corresponding cells for display, and at least two of said elements include text, said method comprising the steps of:

(a) determining display space requirement (DSR) for displaying the elements;

(b) moderating the DSR value of any element to determine its moderated display space requirement (ModDSR) value, by reducing the DSR value of said element such that the amount of reduction depends on the difference between the DSR value of said element and a value representative of the DSR values of the elements corresponding to the column or row to which said element corresponds;

(c) allocating column widths and row heights, based on the ModDSR values or on values obtained by using the ModDSR values; and

(d) displaying the elements in the space allocated to the corresponding cells.

2. The method of claim 1 wherein in step (a) the DSR is determined for any text element using any one of the following steps:

(a) measuring text using a uniform font size;

(b) measuring text using a uniform font size which is also the permitted minimum font size;

(c) measuring text using a uniform font size for each group of elements required to be displayed using a common font size; or

(d) counting the number of text characters.

3. The method of claim 1 wherein in step (a) the DSR of text elements is determined after abbreviating the text.

4. The method of claim 1 wherein in step (b) the value representative of the DSRs of the elements corresponding to the column or row comprises any one of:

- (a) average of the DSR values of the elements
- 5 corresponding to the column or row, respectively;
- (b) average of the DSR values of the elements corresponding to the column or row, respectively, excluding one or more of extremely large DSR values or extremely small DSR values;
- 10 (c) median of the DSR values of the elements corresponding to the column or row, respectively; or
- (d) any representative value derived from the DSR values of one or more elements corresponding to the column or row, respectively.

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5. The method of claim 1 wherein in step (b) the amount of reduction also depends on a measure of the space wastage which is inherent to a matrix format display.

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6. The method of claim 1 wherein in step (c) the highest of said values corresponding to each column or to each row are used as a basis for allocating column widths or row heights, respectively.

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7. The method of claim 1 wherein allocating step (c) includes:

- (a) measuring the lopsidedness of distribution of larger elements across columns and across rows; and
- (b) depending upon whether the lopsidedness is greater
- 30 across columns or across rows, allocating column widths or row heights, respectively, as a first allocation and thereafter in a second allocation allocating row heights or column widths, respectively.

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8. The method of claim 1 wherein in step (c) said values obtained by using the ModDSR values depend on a measure of relative lopsidedness across columns and across rows.

9. The method of claim 1 further comprising any one of:

(a) selecting the largest possible font size, from within a permitted font size range, for accomodating each element within the display space allocated to the corresponding cell;

(b) selecting the largest possible uniform font size, from within a permitted font size range, for accomodating the elements within the predetermined two dimensional display space; or

(c) selecting the largest possible set of multiple uniform font sizes, from within a permitted font size range, for accomodating the elements within the predetermined two dimensional display space with font size variations based on relative font size differences indicated in a source file.

10. The method of claim 9 wherein selecting the largest possible font size is supported by at least one of the following steps:

(a) abbreviating text;

(b) reducing internal leading space between lines of text; or

(c) reducing image size.

11. The method of claim 1 wherein said predetermined two dimensional display space is determined by the system by calculating the minimum space required to display the information array elements in matrix format.

12. The method of claim 11 wherein said calculating step is executed with regard to user's preferences relating to at least one of:

(a) permitted font size range;

(b) acceptable extent of text abbreviation; or

(c) internal leading space reduction option.

13. The method of claim 1 wherein one or more elements of the information array include images, in addition to or instead of text strings, and the images are reduced in size to reduce their DSR.

14. The method of claim 13 wherein, while reducing the images, the proportion of reduction is less for a smaller image and more for a larger image.

5 15. The method of claim 1 wherein at least one cell is a joined cell formed by joining contiguous cells in a column or in a row.

16. The method of claim 1 wherein the displaying step
10 (d) includes printing.

17. A method for displaying elements of an information array within a predetermined two dimensional display space, wherein the predetermined two dimensional display space is
15 divided into cells formed at intersections of columns and rows, the elements of the information array have corresponding cells for display, and at least two of said elements include text, said method comprising the steps of:

(a) determining display space requirement (DSR) for
20 displaying the elements;

(b) determining moderated display space requirement (ModDSR) values for elements corresponding to each column or to each row;

(c) measuring the lopsidedness of distribution of larger
25 elements across columns and across rows;

(d) depending upon whether the lopsidedness is greater across columns or across rows, allocating column widths or row heights, respectively, as a first allocation based on ModDSR values or on values obtained by using the ModDSR values and
30 thereafter in a second allocation allocating row heights or column widths, respectively; and

(e) displaying the elements in the space allocated to the corresponding cells.

35 18. The method of claim 17 wherein in step (b) said ModDSR values are determined by reducing the DSR value of each said element such that the amount of reduction depends on the difference between the DSR value of said element and a value

representative of the DSR values of the elements corresponding to the column or row to which said element corresponds.

19. The method of claim 18 wherein the amount of
5 reduction also depends on a measure of the space wastage which is inherent to a matrix format display.

20. The method of claim 17 wherein in step (d) the
highest of said values corresponding to each column or to each
10 row are used as a basis for allocating column widths or row heights, respectively.

21. The method of claim 17 wherein in step (d) said
values obtained by using the ModDSR values depend on a measure
15 of relative lopsidedness across columns and across rows.

22. A method for displaying elements of an information
array within a predetermined two dimensional display space,
wherein, the elements of the information array have
20 corresponding cells arranged into columns or rows for
displaying in the predetermined two dimensional display space
and at least two of said elements include text, said method
comprising the steps of:

(a) determining display space requirement (DSR) for
25 displaying the elements;

(b) checking whether the predetermined two dimensional
display space is adequate for displaying the information array
elements in a matrix format and, if found to be inadequate,
executing the following steps;

(c) allocating column widths or row heights in proportion
30 to the total of the DSR values of the elements corresponding
to the cells arranged into each corresponding column or row,
respectively;

(d) within each column or row, allocating height or width,
35 respectively, to cells in proportion to the DSR values of the
elements corresponding to the cells within each such column or
row, respectively; and

(e) displaying the elements in the space allocated to the

corresponding cells.

23. The method of claim 22 wherein step (b) includes:

- (a) resolving the DSR values of the elements to their
5 corresponding cell widths and cell heights;
- (b) for each column, setting the column width equal to
the largest cell width in that column;
- (c) for each row, setting the row height equal to the
largest cell height in that row;
- 10 (d) calculating the space required for matrix format
display, by using the widths and heights determined in steps
(b) and (c); and
- (e) comparing the space required for matrix format
display with the predetermined two dimensional display space
15 to determine whether the information array elements can be
displayed in a matrix format.

24. The method of claim 22 further including, using a
colour or shading pattern in cells to make up for loss of
20 alignment of cells across columns or across rows, respectively.

25. A system for displaying elements of an information
array within a predetermined two dimensional display space,
wherein the predetermined two dimensional display space is
25 divided into cells formed at intersections of columns and rows,
the elements of the information array have corresponding cells
for display, and at least two of said elements include text,
said system comprising of:

- (a) means for determining display space requirement (DSR)
30 for displaying the elements;
- (b) means for moderating the DSR value of any element to
determine its moderated display space requirement (ModDSR)
value, by reducing the DSR value of said element such that the
amount of reduction depends on the difference between the DSR
35 value of said element and a value representative of the DSR
values of the elements corresponding to the column or row to
which said element corresponds;
- (c) means for allocating column widths and row heights,

based on the ModDSR values or on values obtained by using the ModDSR values; and

(d) means for displaying the elements in the space allocated to the corresponding cells.

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26. The system of claim 25 further comprising at least one of the following:

(a) means for specifying acceptable extent of text abbreviation;

10 (b) means for specifying permitted font size range;

(c) means for selecting internal leading space reduction;

(d) means for selecting allocation of column widths or row heights as a first allocation;

(e) means for selecting font sizes for display in cells;

15 or

(f) means for using abbreviated form of text elements for determining DSR values.

20 27. A computer-readable medium embodying the method in claim 1.

28. A compacted display format generated by employing the method in claim 1.

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